

عنوان مقاله:

Kinetics of Austenite Recrystallization during the Annealing of Cold-rolled Fe-Mn-Al-C Steel

محل انتشار:

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خلاصه مقاله:

In the current study, the recrystallization behavior of 75% cold-rolled Fe-22Mn-10Al-1.4C steel during annealing at 750, 770, 790, 810, and 830°C was studied. X-ray diffraction patterns and optical microscopy were used to characterize microstructures. The Vickers Micro-hardness test was used to characterize recrystallization kinetics during annealing. Johnson-Mehl-Avrami-Kolmogorov (JMAK) model was used to evaluate the experimental data. The as-homogenized microstructure illustrated only austenite with a high fraction of annealing twins, and austenite to martensite phase transformation was not observed after quenching at a high temperature and also until high thickness reduction. Avrami exponent was decreased from 0.76 to 0.42, with increasing the annealing temperature from 750 to 830°C. The activation energy value was determined to be ~175 kJ/mol, which was slightly higher than the diffusion activation energy of carbon in austenite.

کلمات کلیدی:

Fe-Mn-Al-C steel, recrystallization kinetics, JMAK model

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